

# TA-F448EB

## SERVICE MANUAL

*AEP Model*  
*UK Model*



### SPECIFICATIONS

#### Amplifier section

##### DIN power output

85 W + 85 W (4 ohms at 1 kHz)  
55 W + 55 W (8 ohms at 1 kHz)

##### Total harmonic distortion

Less than 0.008% (at 10 W output)

##### Frequency response

PHONO (20 Hz – 20 kHz): RIAA equalization curve  $\pm 0.5$  dB<sup>+11</sup><sub>-3</sub>  
TUNER, CD, AUX, TAPE1/DAT, TAPE2/MD: 7 Hz – 100 kHz    dB

##### S/N (network A)

PHONO: 94 dB  
TUNER, CD, AUX, TAPE1/DAT, TAPE2/MD: 105 dB

##### Output voltage/impedance

RECOUT: 150 mV, 1 kilohm  
PHONES: 10 mW (at 8 ohms)

##### Speakers impedance

4 – 16 ohms, 8 – 16 ohms (SPEAKERS A + B)

##### Damping factor

100 (8 ohms, 1 kHz)

#### General

##### System

Power amplifier: Pure-complementary SEPP OCL power amplifier with all stages directly coupled  
Preamplifier: Low-noise, equalizer amplifier

##### Power requirements

230 V AC, 50/60 Hz

##### Power consumption

180 W

##### Dimensions (approx.) (w/h/d)

430 × 135 × 365 mm  
incl. projecting parts and controls

##### Mass (approx.)

6.8 kg

Design and specifications are subject to change without notice.

## INTEGRATED STEREO AMPLIFIER





# SONY®

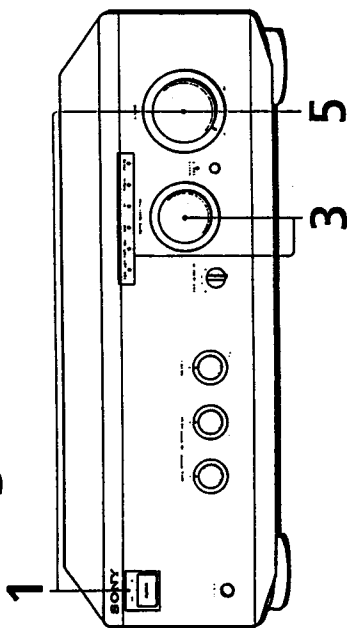
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### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  OR DOTTED LINE WITH MARK  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

# Listening to the Music



**To listen through the headphones**  
Connect the headphones to PHONES and set SPEAKERS to OFF (TA-F48EB only).

**To listen directly to the input signal (TA-F248E only)**  
Press SOURCE DIRECT so that the indicator lights up. Since the circuits of TONE controls and BALANCE control are bypassed, you cannot adjust bass, treble, or the balance while listening to a source directly.

**Note**  
Avoid high speaker output at which the sound is distorted. High-frequency distortion may damage the tweeters.

**1** Press POWER to turn on the amplifier and turn VOLUME fully counterclockwise to prevent damaging the speakers with excessive output.  
The PROTECTION indicator lights up, then goes off.

**2** Turn on the programme source you want to listen to.

**3** Set INPUT SELECTOR to the respective programme source.  
The indicator for the programme source lights up.

To listen to a	Turn INPUT SELECTOR for
Record	PHONO
Radio broadcast	TUNER
Compact disc	CD
Source connected to AUX	AUX
Source connected to:	
—TAPE1/DAT	TAPE1/DAT
—TAPE2/MD	TAPE2/MD

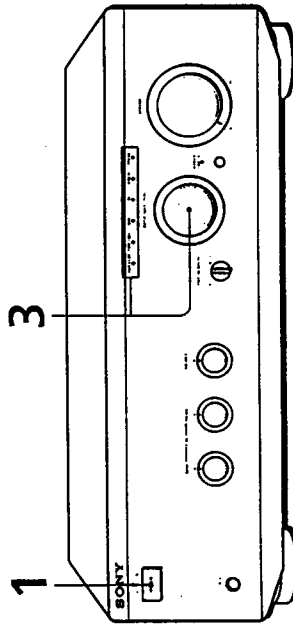
**4** Start the programme source.

**5** Adjust the volume by turning VOLUME.

Make sure that SPEAKERS is set to ON (TA-F48EB only).

To	Press or turn
Adjust the bass (TA-F248E only)	BASS
Adjust the treble (TA-F248E only)	TREBLE
Adjust the balance (TA-F248E only)	BALANCE

# Recording



**To record the same source on two recording components at the same time**  
You can monitor the recorded sound.

**To monitor the recorded sound**  
If you record on a tape deck which has separate playback and recording heads, you can monitor the recorded sound. To monitor the sound, set TAPE MONITOR to TAPE1 or TAPE2.

**1** Press POWER to turn on the amplifier.  
The PROTECTION indicator lights up, then goes off.

**2** Turn on the programme source you want to record.

**3** Select the programme source that you want to record by turning INPUT SELECTOR.  
The indicator for the programme source lights up.

To record a	Set INPUT SELECTOR to
Record	PHONO
Radio broadcast	TUNER
Compact disc	CD
Source connected to AUX	AUX
Source connected to:	
—TAPE1/DAT	TAPE1/DAT
—TAPE2/MD	TAPE2/MD

**4** Prepare the recording component for recording, then start recording.

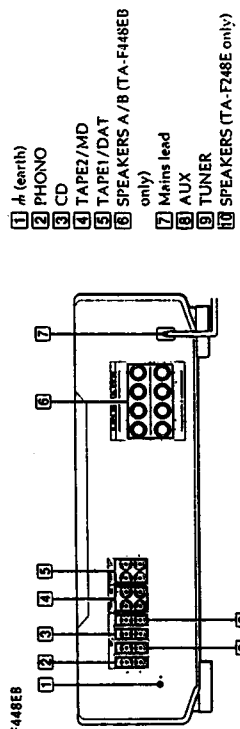
**5** Start playing the programme source.

## SECTION 1 GENERAL

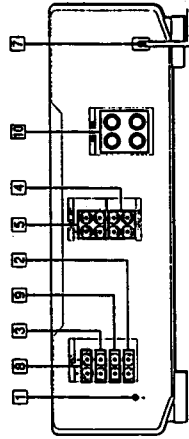
This section is extracted from instruction manual.

Rear Panel Descriptions

• TA-F448EB



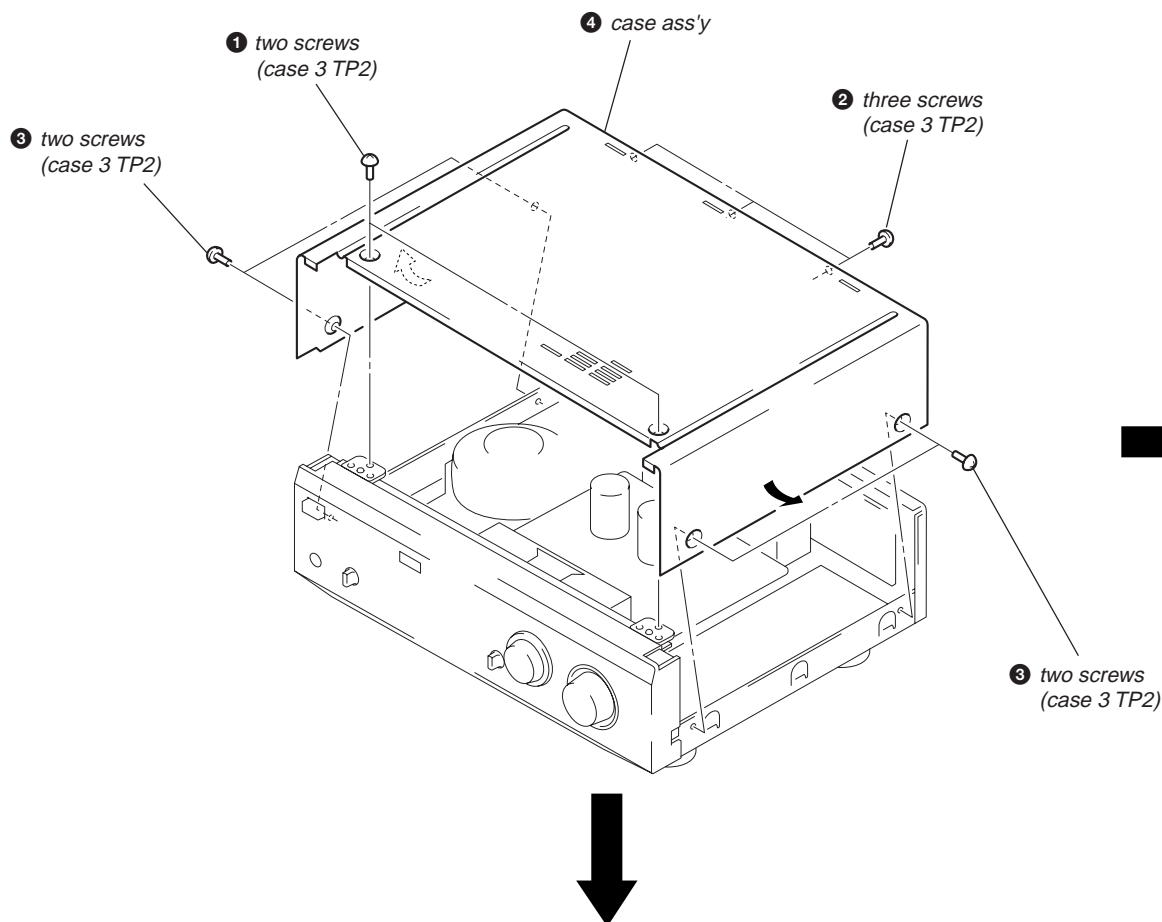
• TA-F248E



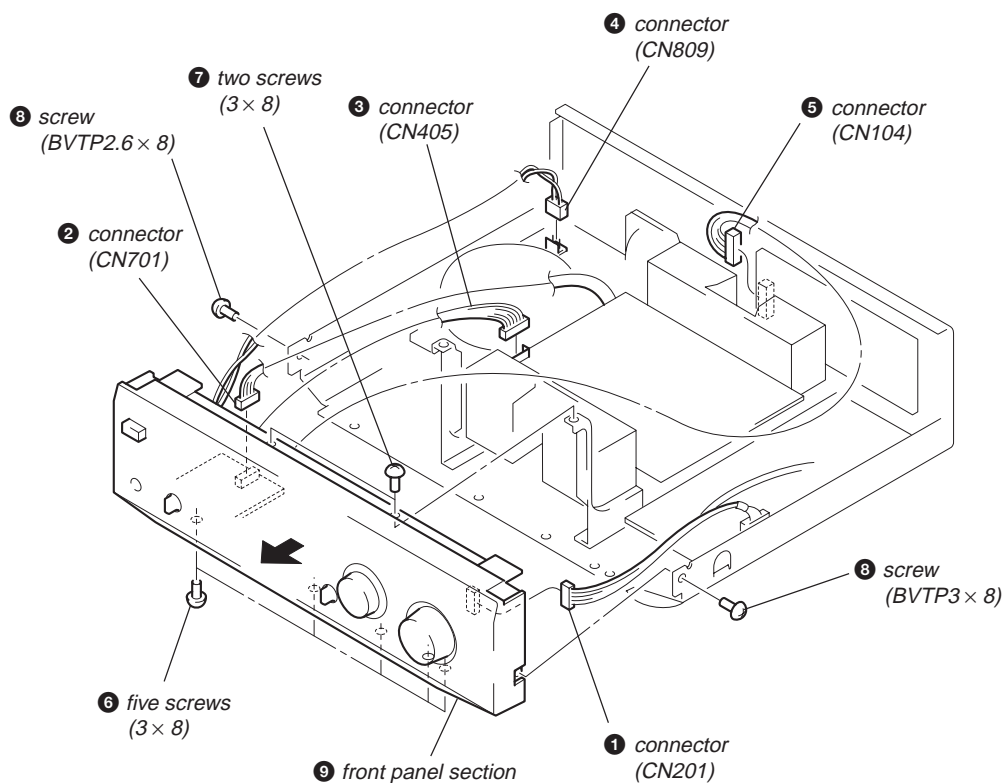
## SECTION 2 DISASSEMBLY

**Note:** Follow the disassembly procedure in the numerical order given.

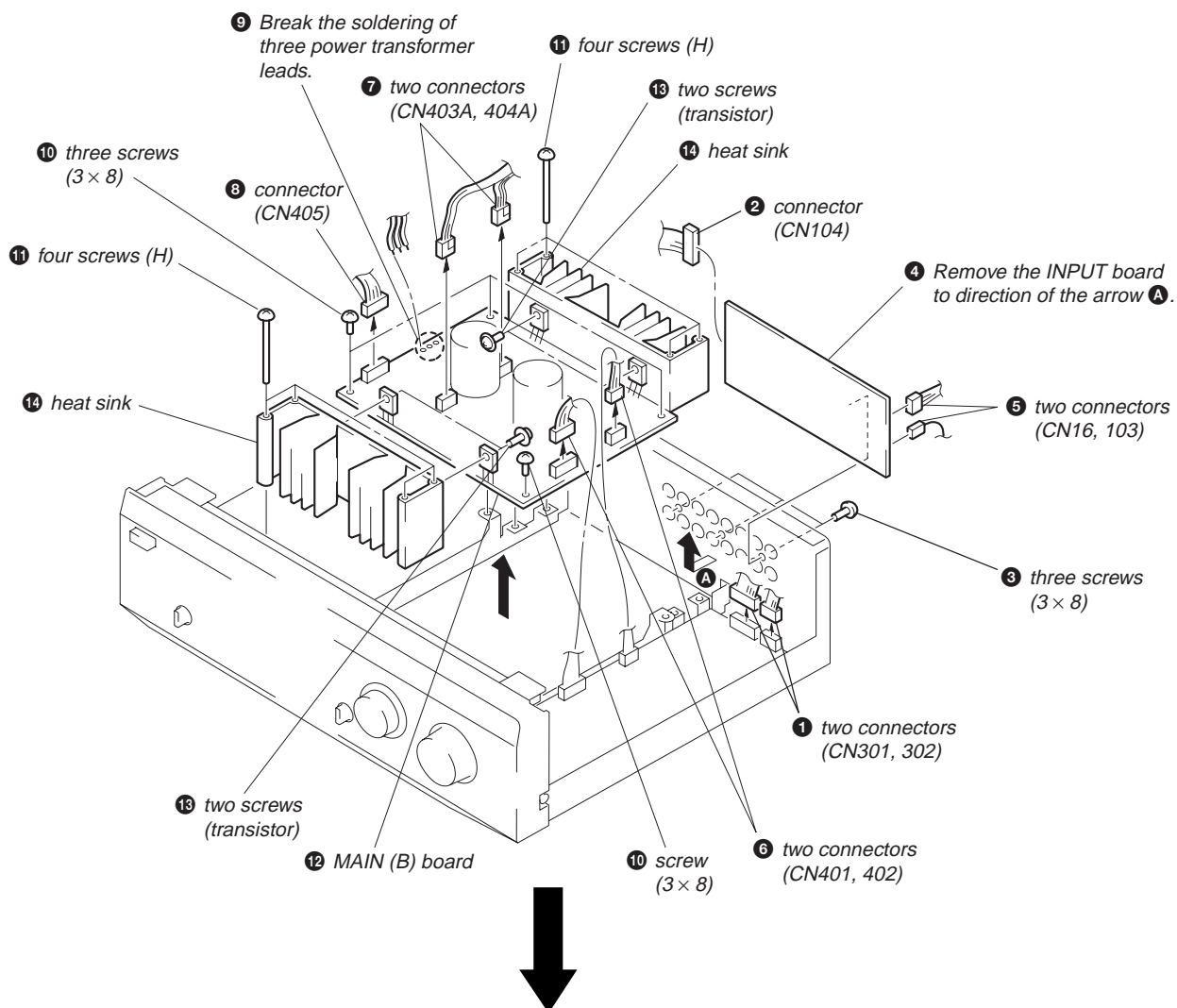
### CASE ASS'Y



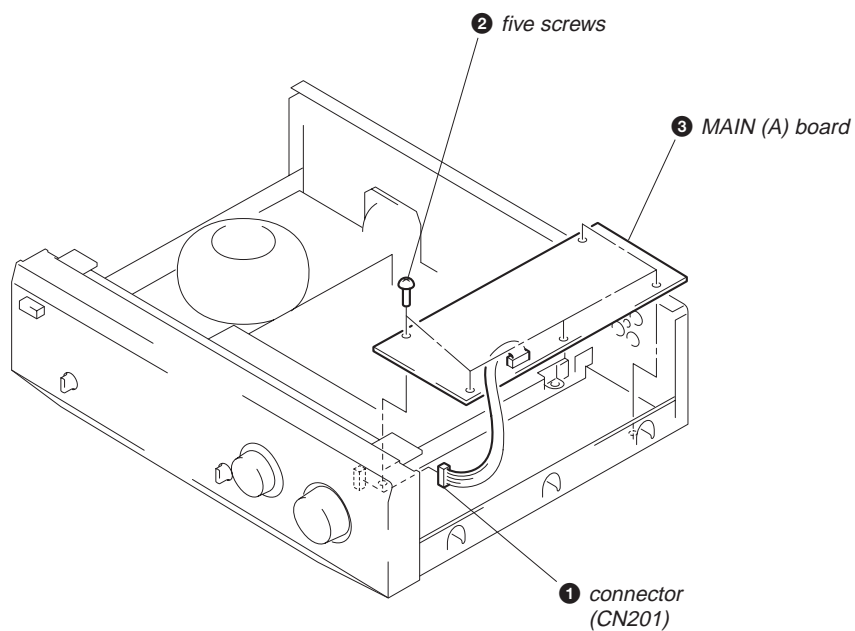
### FRONT PANEL SECTION



## INPUT BAORD, MAIN (B) BAORD



## MAIN (A) BOARD



## SECTION 3 ELECTRICAL ADJUSTMENT

### BIAS ADJUSTMENT

#### Adjustment Procedure:

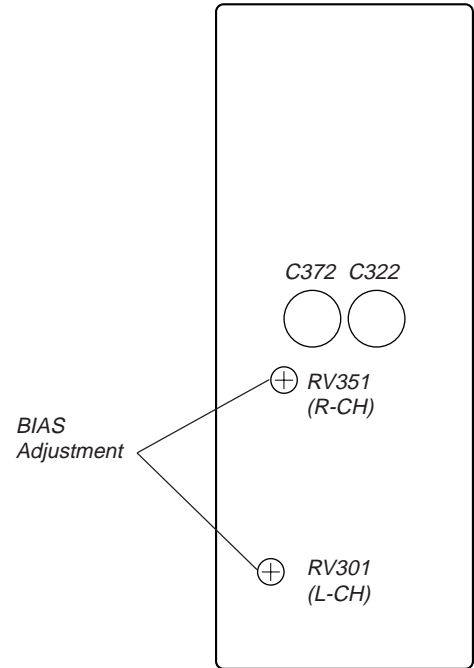
1. Rotate fully the bias adjusting semi-fixed resistors (RV301 (L-CH), RV351 (R-CH)) to the minimum position (counterclockwise).
2. Connect a digital voltmeter to the CN406 (L-CH) and CN407 (R-CH).

	pin ①	pin ③
CN406 (L-CH)	–	+
CN407 (R-CH)	+	–

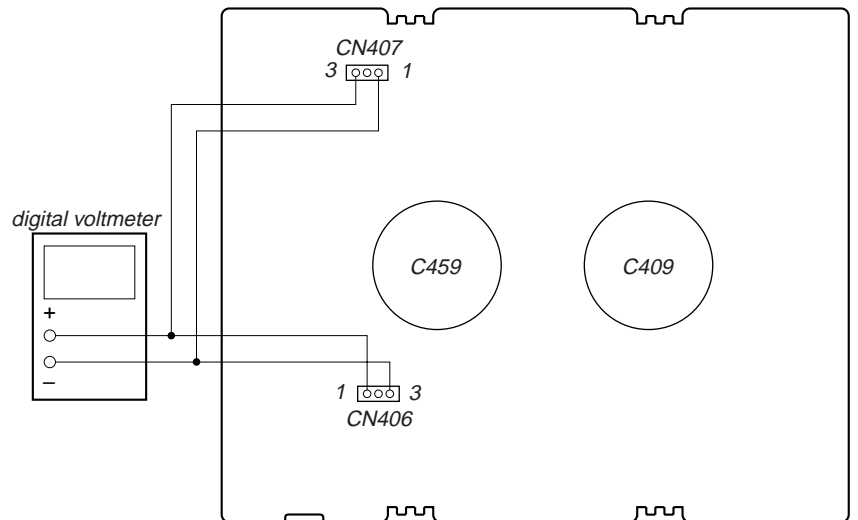
3. Set the slidack to 0 V AC, and press the **POWER** button (ON) on the set.
4. Raise gradually the slidack voltage up to the rated voltage (230 V AC).
5. At this time, confirm that the speaker relay is turned on (it will click).
6. Adjust the RV301 (L-CH) and RV351 (R-CH) so that a reading of digital voltmeter is from 10 mV to 20 mV.
7. Return the slidack to 0 V AC, and press the **POWER** button (OFF) on the set.

#### Connection and Adjustment Location:

##### [MAIN (A) BOARD] – Component side –



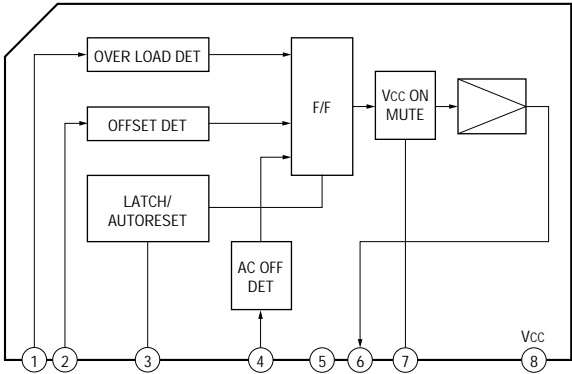
##### [MAIN (B) BOARD] – Component side –



# SECTION 4 DIAGRAMS

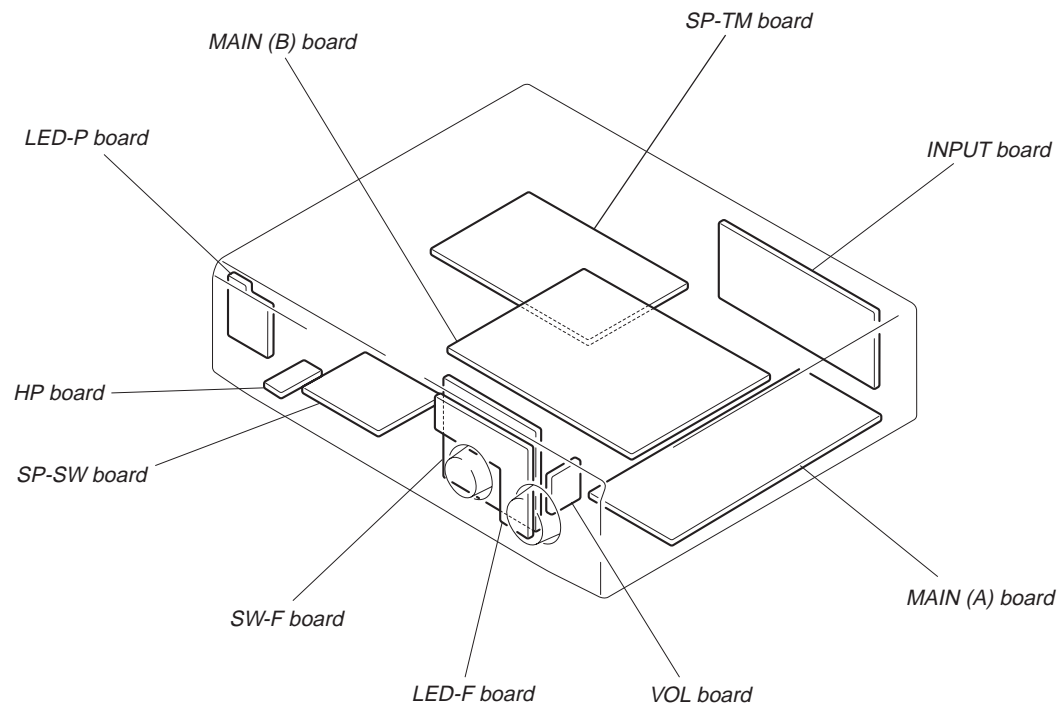
• IC Block Diagram

IC401     $\mu$ PC1237HA



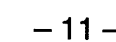


• **Circuit Boards Location**



Ref. No.	Location	Ref. No.	Location
D101	B-11	Q101	B-11
D102	B-10	Q102	B-10
D103	B-10	Q103	B-10
D104	B-9	Q104	B-9
D105	B-8	Q105	B-8
D106	B-7	Q106	B-7
D107	B-12	Q301	G-13
D108	B-8	Q302	G-13
D301	G-12	Q303	H-11
D302	H-12	Q304	G-6
D303	G-7	Q305	G-6
D304	G-7	Q306	G-6
D305	H-7	Q307	G-7
D306	I-6	Q308	G-7
D307	H-6	Q309	H-7
D308	H-6	Q310	H-7
D309	H-6	Q311	G-7
D351	G-12	Q312	I-6
D352	F-11	Q351	G-13
D353	G-8	Q352	G-13
D354	G-8	Q353	G-11
D355	H-8	Q354	G-10
D356	I-9	Q355	G-10
D357	H-10	Q356	G-10
D358	H-10	Q357	G-9
D359	H-10	Q358	G-9
D403	D-22	Q359	H-9
D404	D-22	Q360	H-8
D405	D-22	Q361	G-6
D406	D-22	Q362	I-10
D407	E-22	Q401	F-17
D408	E-22	Q402	F-18
D409	C-22	Q403	G-21
D410	D-22	Q404	G-18
D411	C-22	Q405	F-21
D412	D-23	Q406A	G-22
D501	C-25	Q407	F-22
D601	H-4	Q430	B-22
D602	H-4	Q451	C-17
D603	H-3	Q452	C-18
D604	H-3	Q453	A-18
D605	H-2	Q454	A-21
D606	H-1	Q455	B-22
D701	H-27	Q601	C-2
D702	J-23	Q602	C-2
		Q603	B-2
IC301	G-12	Q604	B-2
IC401	C-23	Q701	H-25
		Q702	I-25

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## SECTION 5

### EXPLODED VIEWS

NOTE:

- Color Indication of Appearance Parts

KNOB. B

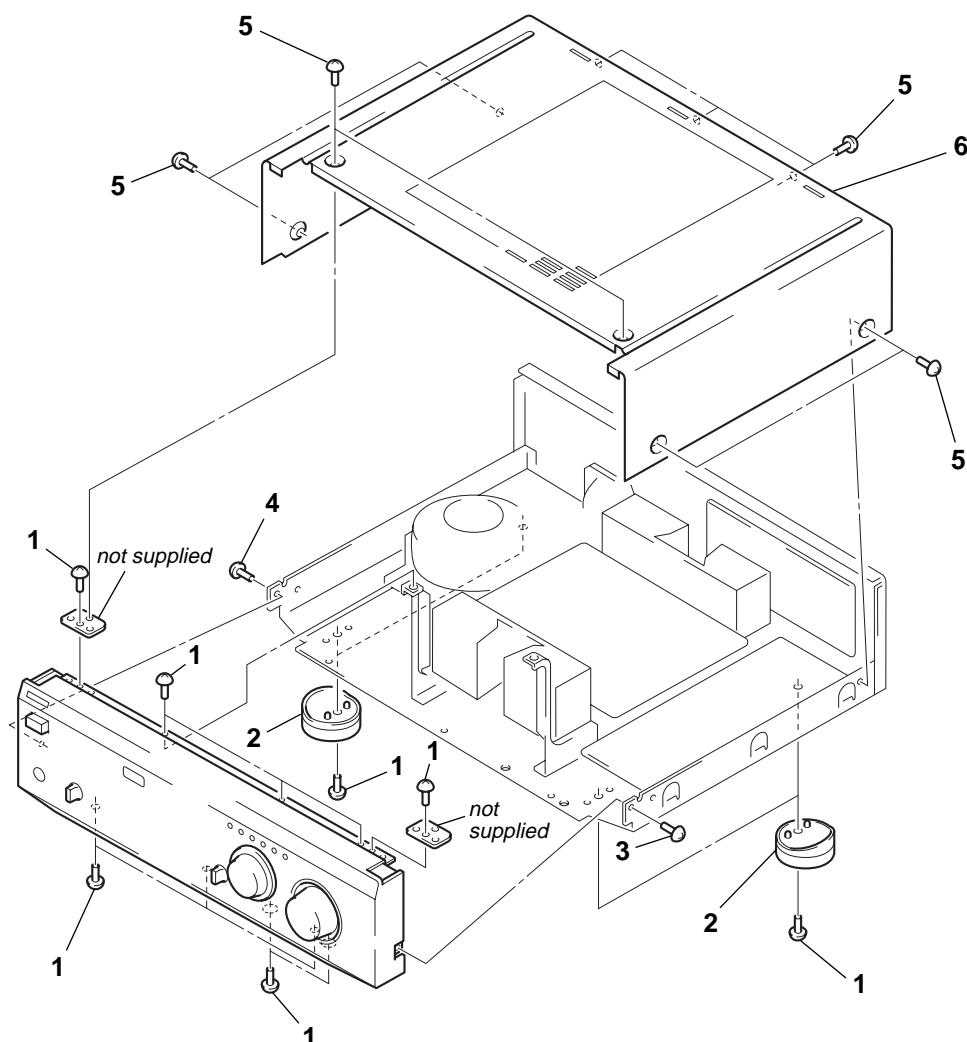
$\dots, \dots, \dots$  ( $\dots$ ,  $\dots$ ) ( $\dots$ ,  $\dots$ )

[illegible]

- Items marked “\*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Accessories and packing materials are given in the last of the electrical parts list.

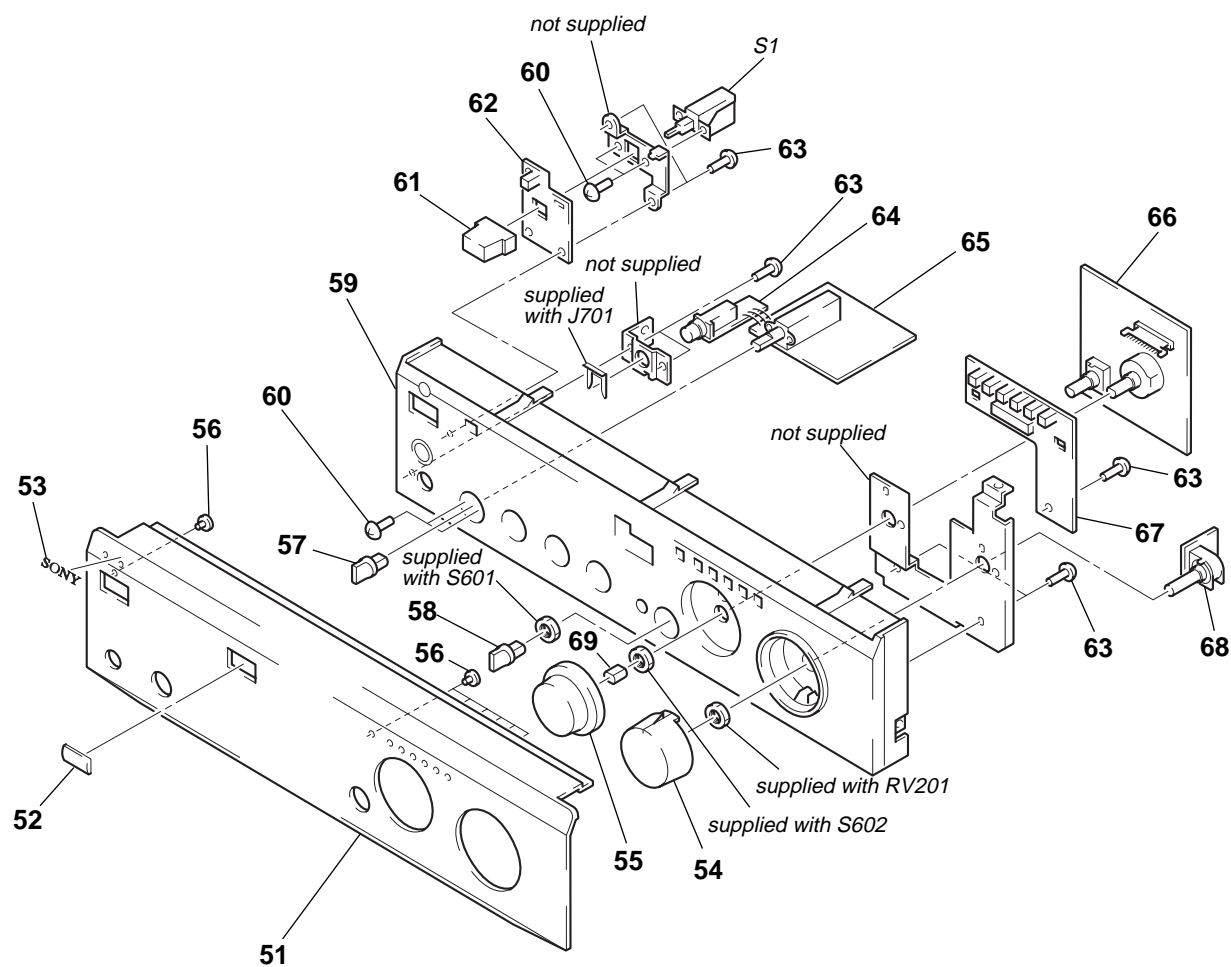
The components identified by mark  $\triangle$  or dotted line with mark  $\triangle$  are critical for safety.  
Replace only with part number specified.

### (1) CASE SECTION



<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>
1	4-967-961-01	SCREW (3X8)		4	4-951-620-01	SCREW (2.6X8), +BVTP	
2	X-4947-025-1	FOOT ASSY		5	3-363-099-61	SCREW (CASE 3 TP2)	
3	7-685-872-09	SCREW +BVTT 3X8 (S)		6	X-4948-403-1	CASE ASSY	

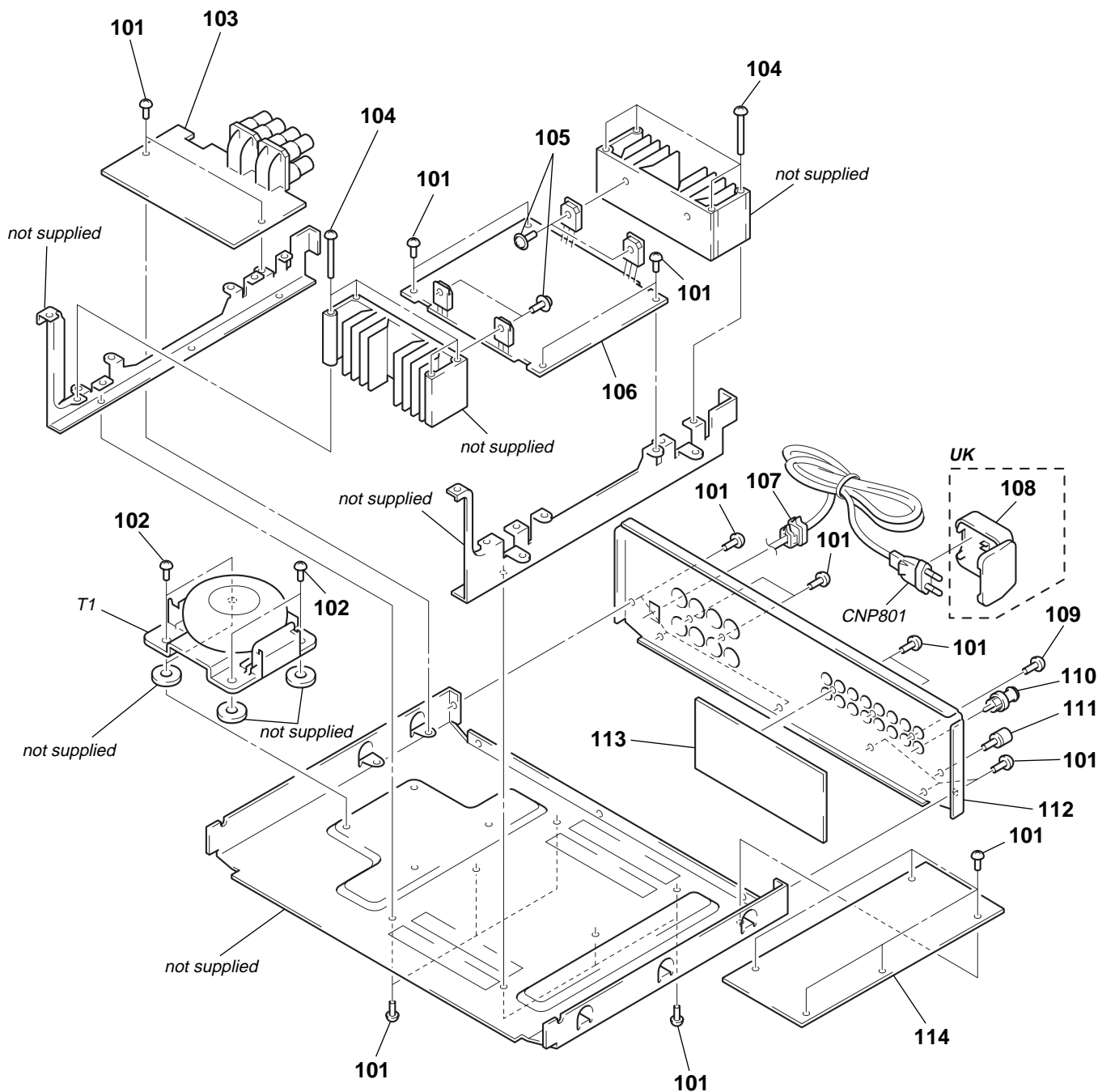
(2) FRONT PANEL SECTION



The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
51	4-980-767-12	PANEL, FRONT		61	4-980-199-01	BUTTON (POWER)	
52	4-965-651-01	EMBLEM (MOS)		* 62	1-662-195-11	LED-P BOARD	
53	4-979-587-01	EMBLEM (NO.5), SONY		63	4-951-620-01	SCREW (2.6X8), +BVTP	
54	X-4946-920-1	KNOB (VOL) ASSY		* 64	1-662-197-11	HP BOARD	
55	4-980-771-01	KNOB (DIA. 47)		* 65	1-662-196-11	SP-SW BOARD	
56	4-980-775-01	LENS, LED		* 66	1-662-193-11	SW-F BOARD	
57	4-980-774-11	KNOB (F11)		* 67	1-662-194-11	LED-F BOARD	
58	4-980-774-01	KNOB (F11)		* 68	1-662-192-11	VOL BOARD	
59	X-4946-944-1	PANEL ASSY, BASE		69	3-703-466-00	SPRING (6600)	
60	7-685-872-09	SCREW +BVTT 3X8 (S)		$\Delta$ S1	1-554-920-11	SWITCH, PUSH (AC POWER)(1 KEY)(POWER)	

### (3) CHASSIS SECTION



The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety.  
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
101	4-967-961-01	SCREW (3X8)		110	1-506-113-00	SHORT PLUG	
102	4-967-960-01	SCREW (4X8)		111	4-947-010-01	SCREW, FEEDER FIXED	
* 103	1-665-580-11	SP-TM BOARD		* 112	4-982-978-21	PANEL, BACK (AEP)	
104	4-981-016-11	SCREW (H)		* 112	4-982-978-31	PANEL, BACK (UK)	
105	3-905-609-11	SCREW (TRANSISTOR)		* 113	1-662-191-11	INPUT BOARD	
* 106	A-4398-160-A	MAIN (B) BOARD, COMPLETE		* 114	A-4398-159-A	MAIN (A) BOARD, COMPLETE	
* 107	3-703-244-00	BUSHING (2104), CORD		$\Delta$ CNP801	1-777-185-11	CORD, POWER	
$\Delta$ 108	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (UK)		$\Delta$ T1	1-431-295-11	TRANSFORMER, POWER	
109	3-704-515-41	SCREW (BV/RING)					

SECTION 6

ELECTRICAL PARTS LIST

- NOTE:
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
  - XX and -X mean standardized parts, so they may have some difference from the original one.
  - RESISTORS  
All resistors are in ohms.  
METAL: Metal-film resistor.  
METAL OXIDE: Metal oxide-film resistor.  
F: nonflammable
  - Items marked “\*” are not stocked since they are seldom required for routine service.  
Some delay should be anticipated when ordering these items.
  - SEMICONDUCTORS  
In each case, u:  $\mu$ , for example:  
uA. . :  $\mu$ A. .      uPA. . :  $\mu$ PA. .  
uPB. . :  $\mu$ PB. .    uPC. . :  $\mu$ PC. .  
uPD. . :  $\mu$ PD. .
  - CAPACITORS  
uF:  $\mu$ F
  - COILS  
uH:  $\mu$ H
- The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety.  
Replace only with part number specified.

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description	Remark				Ref. No.	Part No.	Description	Remark			
*	1-662-197-11	HP BOARD *****					Q106	8-729-119-78	TRANSISTOR 2SC2785-HFE				
< JACK >							< RESISTOR >						
J701	1-750-735-11	JACK (LARGE TYPE) (PHONES)					R101	1-259-500-11	CARBON 1M 5% 1/6W				
*****							R102	1-259-500-11	CARBON 1M 5% 1/6W				
							R103	1-259-500-11	CARBON 1M 5% 1/6W				
							R104	1-259-428-11	CARBON 1K 5% 1/6W				
*	1-662-191-11	INPUT BOARD *****					R105	1-259-500-11	CARBON 1M 5% 1/6W				
< CAPACITOR >							R106	1-259-428-11	CARBON 1K 5% 1/6W				
C101	1-136-165-00	FILM 0.1uF 5% 50V					R107	1-259-500-11	CARBON 1M 5% 1/6W				
C102	1-136-165-00	FILM 0.1uF 5% 50V					R108	1-249-210-11	CARBON 1K 5% 1/3W				
C103	1-136-165-00	FILM 0.1uF 5% 50V					R109	1-259-444-11	CARBON 4.7K 5% 1/6W				
C104	1-136-165-00	FILM 0.1uF 5% 50V					R110	1-259-444-11	CARBON 4.7K 5% 1/6W				
C105	1-136-165-00	FILM 0.1uF 5% 50V					R111	1-259-444-11	CARBON 4.7K 5% 1/6W				
							R112	1-259-444-11	CARBON 4.7K 5% 1/6W				
C106	1-136-165-00	FILM 0.1uF 5% 50V					R113	1-259-444-11	CARBON 4.7K 5% 1/6W				
< CONNECTOR >							R114	1-259-444-11	CARBON 4.7K 5% 1/6W				
CN16	1-564-320-00	PIN, CONNECTOR (B2P-VH) 2P					R151	1-259-500-11	CARBON 1M 5% 1/6W				
CN103	1-691-766-11	PLUG (MICRO CONNECTOR) 4P					R152	1-259-500-11	CARBON 1M 5% 1/6W				
* CN104	1-564-527-11	PLUG, CONNECTOR 12P					R153	1-259-500-11	CARBON 1M 5% 1/6W				
< DIODE >							R154	1-259-428-11	CARBON 1K 5% 1/6W				
D101	8-719-987-63	DIODE 1N4148M					R155	1-259-500-11	CARBON 1M 5% 1/6W				
D102	8-719-987-63	DIODE 1N4148M					R156	1-259-428-11	CARBON 1K 5% 1/6W				
D103	8-719-987-63	DIODE 1N4148M					< RELAY >						
D104	8-719-987-63	DIODE 1N4148M					RY101	1-515-614-11	RELAY				
D105	8-719-987-63	DIODE 1N4148M					RY102	1-515-614-11	RELAY				
D106	8-719-987-63	DIODE 1N4148M					RY103	1-515-614-11	RELAY				
D107	8-719-987-63	DIODE 1N4148M					RY104	1-515-614-11	RELAY				
D108	8-719-987-63	DIODE 1N4148M					RY105	1-515-614-11	RELAY				
< PIN JACK >							RY106	1-515-614-11	RELAY				
J101	1-568-978-51	JACK 6P (PHONO/TUNER/CD INPUT)					RY107	1-515-622-11	RELAY				
J102	1-568-978-11	JACK 6P (AUX INPUT, TAPE2/MD IN/RECOUT)					RY108	1-515-622-11	RELAY				
* J103	1-573-142-21	JACK, PIN 4P (TAPE1/DAT IN/RECOUT)					*****						
< TRANSISTOR >							*	1-662-194-11	LED-F BOARD *****				
< CONNECTOR >							< CONNECTOR >						
Q101	8-729-119-78	TRANSISTOR 2SC2785-HFE											
Q102	8-729-119-78	TRANSISTOR 2SC2785-HFE											
Q103	8-729-119-78	TRANSISTOR 2SC2785-HFE											
Q104	8-729-119-78	TRANSISTOR 2SC2785-HFE					CNJ601	1-766-796-11	CONNECTOR, BOARD TO BOARD 12P				
Q105	8-729-119-78	TRANSISTOR 2SC2785-HFE											

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
< DIODE >						C368	1-126-023-11	ELECT	100uF	20%	16V
						C369	1-126-023-11	ELECT	100uF	20%	16V
D601	8-719-313-50	LED SEL6810A-TH12 (PHONO)				C370	1-110-393-11	ELECT	100uF	20%	63V
D602	8-719-313-50	LED SEL6810A-TH12 (TUNER)				C371	1-113-496-11	POLYSTYRENE	4PF	10%	50V
D603	8-719-313-50	LED SEL6810A-TH12 (CD)				C372	1-109-871-11	ELECT	2700uF	20%	50V
D604	8-719-313-50	LED SEL6810A-TH12 (AUX)				< CONNECTOR >					
D605	8-719-313-50	LED SEL6810A-TH12 (TAPE2/MD)									
*****						CN301	1-691-767-11	PLUG (MICRO CONNECTOR) 5P			
						CN302	1-691-765-11	PLUG (MICRO CONNECTOR) 3P			
*****						< DIODE >					
*	1-662-195-11	LED-P BOARD				D301	8-719-310-61	LED SEL1510C-D			
		*****				D302	8-719-933-88	DIODE HZS16-2L			
< DIODE >						D303	8-719-933-41	DIODE HZS6C3L			
D702	8-719-313-48	LED SEL6210S-TH12 (PROTECTON)				D304	8-719-987-63	DIODE 1N4148M			
< RESISTOR >						D305	8-719-987-63	DIODE 1N4148M			
R705	1-259-143-21	CARBON	100	5%	1/4W	D306	8-719-310-61	LED SEL1510C-D			
*****						D307	8-719-987-63	DIODE 1N4148M			
*****						D308	8-719-987-63	DIODE 1N4148M			
*	A-4398-159-A	MAIN (A) BOARD, COMPLETE				D309	8-719-987-63	DIODE 1N4148M			
		*****				D351	8-719-310-61	LED SEL1510C-D			
< CAPACITOR >						D352	8-719-933-88	DIODE HZS16-2L			
C301	1-102-978-00	CERAMIC	220PF	5%	50V	D353	8-719-933-41	DIODE HZS6C3L			
C302	1-126-059-11	ELECT	10uF	20%	50V	D354	8-719-987-63	DIODE 1N4148M			
C304	1-106-359-00	MYLAR	4700PF	5%	200V	D355	8-719-987-63	DIODE 1N4148M			
C305	1-130-341-00	FILM	0.056uF	3%	100V	D356	8-719-310-61	LED SEL1510C-D			
C306	1-130-971-00	FILM	0.016uF	3%	100V	D357	8-719-987-63	DIODE 1N4148M			
C307	1-126-059-11	ELECT	10uF	20%	50V	D358	8-719-987-63	DIODE 1N4148M			
C308	1-126-022-11	ELECT	47uF	20%	25V	D359	8-719-987-63	DIODE 1N4148M			
C309	1-126-025-11	ELECT	330uF	20%	25V	< IC >					
C310	1-126-023-11	ELECT	100uF	20%	25V	IC301	8-759-701-25	IC NJM2068D-D			
C311	1-102-973-00	CERAMIC	100PF	5%	50V	< COIL >					
C312	1-124-721-11	ELECT	10uF	20%	50V	L301	1-428-203-11	COIL, AIR-CORE			
C313	1-104-290-11	POLYSTYRENE	330PF	5%	50V	L351	1-428-203-11	COIL, AIR-CORE			
C315	1-102-230-00	CERAMIC	4PF	0.25PF	500V	< TRANSISTOR >					
C316	1-126-023-11	ELECT	100uF	20%	16V	Q301	8-729-354-52	TRANSISTOR 2SC2545			
C317	1-126-023-11	ELECT	100uF	20%	16V	Q302	8-729-354-52	TRANSISTOR 2SC2545			
C318	1-126-023-11	ELECT	100uF	20%	16V	Q303	8-729-281-54	TRANSISTOR 2SC1815-BL			
C319	1-126-023-11	ELECT	100uF	20%	16V	Q304	8-729-620-17	TRANSISTOR 2SC2259-FG			
C320	1-110-393-11	ELECT	100uF	20%	63V	Q305	8-729-201-53	TRANSISTOR 2SA1015-GR			
C321	1-113-496-11	POLYSTYRENE	4PF	10%	50V	Q306	8-729-201-53	TRANSISTOR 2SA1015-GR			
C322	1-109-871-11	ELECT	2700uF	20%	50V	Q307	8-729-201-53	TRANSISTOR 2SA1015-GR			
C351	1-102-978-00	CERAMIC	220PF	5%	50V	Q308	8-729-021-74	TRANSISTOR 2SA949-OY-TPE6			
C352	1-126-059-11	ELECT	10uF	20%	50V	Q309	8-729-202-67	FET 2SK246-GR3			
C354	1-106-359-00	MYLAR	4700PF	5%	200V	Q310	8-729-021-73	TRANSISTOR 2SC2229-OY-TPE6			
C355	1-130-341-00	FILM	0.056uF	3%	100V	Q311	8-729-281-54	TRANSISTOR 2SC1815-BL			
C356	1-130-971-00	FILM	0.016uF	3%	100V	Q312	8-729-281-54	TRANSISTOR 2SC1815-BL			
C357	1-126-059-11	ELECT	10uF	20%	50V	Q351	8-729-354-52	TRANSISTOR 2SC2545			
C358	1-126-022-11	ELECT	47uF	20%	25V	Q352	8-729-354-52	TRANSISTOR 2SC2545			
C359	1-126-025-11	ELECT	330uF	20%	25V	Q353	8-729-201-53	TRANSISTOR 2SA1015-GR			
C360	1-126-023-11	ELECT	100uF	20%	25V	Q354	8-729-620-17	TRANSISTOR 2SC2259-FG			
C361	1-102-973-00	CERAMIC	100PF	5%	50V	Q355	8-729-201-53	TRANSISTOR 2SA1015-GR			
C362	1-124-721-11	ELECT	10uF	20%	50V	Q356	8-729-201-53	TRANSISTOR 2SA1015-GR			
C363	1-104-290-11	POLYSTYRENE	330PF	5%	50V	Q357	8-729-201-53	TRANSISTOR 2SA1015-GR			
C365	1-102-230-00	CERAMIC	4PF	0.25PF	500V	Q358	8-729-021-74	TRANSISTOR 2SA949-OY-TPE6			
C366	1-126-023-11	ELECT	100uF	20%	16V						
C367	1-126-023-11	ELECT	100uF	20%	16V						



**MAIN (A)**
**MAIN (B)**

Ref. No.	Part No.	Description				Remark	Ref. No.	Part No.	Description				Remark
Q359	8-729-202-67	FET	2SK246-GR3				R365	1-249-198-11	CARBON	330	5%	1/3W	
Q360	8-729-021-73	TRANSISTOR	2SC2229-OY-TPE6				R366	1-249-198-11	CARBON	330	5%	1/3W	
Q361	8-729-281-54	TRANSISTOR	2SC1815-BL				R367	1-249-198-11	CARBON	330	5%	1/3W	
Q362	8-729-281-54	TRANSISTOR	2SC1815-BL										
< RESISTOR >							R368	1-259-167-21	CARBON	1K	5%	1/4W	
							R369	1-259-151-21	CARBON	220	5%	1/4W	
							R370	1-259-151-21	CARBON	220	5%	1/4W	
R301	1-259-215-21	CARBON	100K	5%	1/4W		R371	1-259-151-21	CARBON	220	5%	1/4W	
R302	1-249-911-11	CARBON	330	5%	1/4W		R372	1-259-215-21	CARBON	100K	5%	1/4W	
R303	1-259-215-21	CARBON	100K	5%	1/4W								
R304	1-249-900-11	CARBON	110	1%	1/4W		R373	1-259-179-21	CARBON	3.3K	5%	1/4W	
R305	1-259-161-21	CARBON	560	5%	1/4W		R374	1-259-175-11	CARBON	2.2K	5%	1/4W	
							R375	1-259-183-11	CARBON	4.7K	5%	1/4W	
R306	1-259-161-21	CARBON	560	5%	1/4W		R376	1-249-490-11	CARBON	27K	5%	1/3W	
R307	1-259-143-21	CARBON	100	5%	1/4W		R377	1-259-151-21	CARBON	220	5%	1/4W	
R308	1-259-191-21	CARBON	10K	5%	1/4W								
R309	1-249-844-11	CARBON	56K	1%	1/2W		R378	1-259-151-21	CARBON	220	5%	1/4W	
R310	1-259-320-11	CARBON	4.7K	1%	1/2W		△R379	1-249-899-11	CARBON	100	5%	1/4W	F
							R380	1-247-749-11	CARBON	560	5%	1/2W	
R311	1-259-167-21	CARBON	1K	5%	1/4W		R381	1-249-496-11	CARBON	100K	5%	1/3W	
R313	1-249-943-11	CARBON	6.8K	5%	1/4W		R382	1-259-171-21	CARBON	1.5K	5%	1/4W	
R314	1-249-198-11	CARBON	330	5%	1/3W								
R315	1-249-198-11	CARBON	330	5%	1/3W		R383	1-259-167-21	CARBON	1K	5%	1/4W	
R316	1-249-198-11	CARBON	330	5%	1/3W		R384	1-259-239-11	CARBON	1M	5%	1/4W	
							R385	1-259-143-21	CARBON	100	5%	1/4W	
R317	1-249-198-11	CARBON	330	5%	1/3W								
R318	1-259-167-21	CARBON	1K	5%	1/4W								
R319	1-259-151-21	CARBON	220	5%	1/4W								
R320	1-259-151-21	CARBON	220	5%	1/4W		RV301	1-241-762-11	RES, ADJ, CARBON 2.2K				
R321	1-259-151-21	CARBON	220	5%	1/4W		RV351	1-241-762-11	RES, ADJ, CARBON 2.2K				
*****													
R322	1-259-215-21	CARBON	100K	5%	1/4W								
R323	1-259-179-21	CARBON	3.3K	5%	1/4W		*	A-4398-160-A	MAIN (B) BOARD, COMPLETE				
R324	1-259-175-11	CARBON	2.2K	5%	1/4W				*****				
R325	1-259-183-11	CARBON	4.7K	5%	1/4W								
R326	1-249-490-11	CARBON	27K	5%	1/3W								
R327	1-259-151-21	CARBON	220	5%	1/4W		C401	1-136-163-00	FILM	0.068uF	5%	50V	
R328	1-259-151-21	CARBON	220	5%	1/4W		C402	1-136-163-00	FILM	0.068uF	5%	50V	
△R329	1-249-899-11	CARBON	100	5%	1/4W	F	C403	1-109-871-11	ELECT	2700uF	20%	50V	
R330	1-247-749-11	CARBON	560	5%	1/2W		C404	1-124-920-11	ELECT	330uF	20%	50V	
R331	1-249-496-11	CARBON	100K	5%	1/3W		C405	1-136-163-00	FILM	0.068uF	5%	50V	
R332	1-259-171-21	CARBON	1.5K	5%	1/4W		C406	1-126-923-11	ELECT	220uF	20%	10V	
R333	1-259-167-21	CARBON	1K	5%	1/4W		C407	1-136-157-00	FILM	0.022uF	5%	50V	
R334	1-259-239-11	CARBON	1M	5%	1/4W		C408	1-126-967-11	ELECT	47uF	20%	16V	
R335	1-259-143-21	CARBON	100	5%	1/4W		C409	1-109-870-11	ELECT	8200uF	20%	50V	
R351	1-259-215-21	CARBON	100K	5%	1/4W		C411	1-126-969-11	ELECT	220uF	20%	50V	
R352	1-249-911-11	CARBON	330	5%	1/4W		C412	1-126-972-11	ELECT	1000uF	20%	50V	
R353	1-259-215-21	CARBON	100K	5%	1/4W		C413	1-126-960-11	ELECT	1uF	20%	50V	
R354	1-249-900-11	CARBON	110	1%	1/4W		C414	1-104-999-11	MYLAR	0.1uF	10%	200V	
R355	1-259-161-21	CARBON	560	5%	1/4W		C415	1-126-025-11	ELECT	330uF	20%	25V	
R356	1-259-161-21	CARBON	560	5%	1/4W		C416	1-126-967-11	ELECT	47uF	20%	16V	
R357	1-259-143-21	CARBON	100	5%	1/4W		C417	1-126-964-11	ELECT	10uF	20%	50V	
R358	1-259-191-21	CARBON	10K	5%	1/4W		C418	1-126-964-11	ELECT	10uF	20%	50V	
R359	1-249-844-11	CARBON	56K	1%	1/2W		C419	1-164-077-11	CERAMIC	220PF	10%	50V	
R360	1-259-320-11	CARBON	4.7K	1%	1/2W		C421	1-137-150-11	MYLAR	0.01uF	10%	100V	
R361	1-259-167-21	CARBON	1K	5%	1/4W		C422	1-137-150-11	MYLAR	0.01uF	10%	100V	
R363	1-249-943-11	CARBON	6.8K	5%	1/4W		C430	1-126-965-11	ELECT	22uF	20%	50V	
R364	1-249-198-11	CARBON	330	5%	1/3W		C451	1-136-163-00	FILM	0.068uF	5%	50V	

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Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
C452	1-136-163-00	FILM	0.068uF	5%	50V	△R402	1-249-393-11	CARBON	10	5%	1/4W F
C453	1-109-871-11	ELECT	2700uF	20%	50V	△R403	1-249-405-11	CARBON	100	5%	1/4W F
C454	1-124-920-11	ELECT	330uF	20%	50V	△R404	1-249-405-11	CARBON	100	5%	1/4W F
						△R405	1-247-745-11	CARBON	330	5%	1/2W F
C459	1-109-870-11	ELECT	8200uF	20%	50V	△R406	1-208-601-11	WIREWOUND	0.1	10%	2W F
C465	1-126-025-11	ELECT	330uF	20%	25V	△R407	1-208-601-11	WIREWOUND	0.1	10%	2W F
C469	1-164-077-11	CERAMIC	220PF	10%	50V	R409	1-259-436-11	CARBON	2.2K	5%	1/6W
< CONNECTOR >						R410	1-259-432-11	CARBON	1.5K	5%	1/6W
CN401	1-691-768-11	PLUG (MICRO CONNECTOR) 6P				R411	1-249-162-11	CARBON	10	5%	1/3W
CN402	1-691-766-11	PLUG (MICRO CONNECTOR) 4P									
CN405	1-691-768-11	PLUG (MICRO CONNECTOR) 6P				R412	1-259-488-11	CARBON	330K	5%	1/6W
CN406	1-564-506-11	PLUG, CONNECTOR 3P				R413	1-259-452-11	CARBON	10K	5%	1/6W
CN407	1-564-506-11	PLUG, CONNECTOR 3P				R414	1-259-484-11	CARBON	220K	5%	1/6W
* CN408	1-564-687-11	PIN, CONNECTOR 3P				R415	1-259-460-11	CARBON	22K	5%	1/6W
* CN403A	1-564-104-00	PIN, CONNECTOR (B3P-VH) 3P				R416	1-259-480-11	CARBON	150K	5%	1/6W
CN404A	1-564-320-00	PIN, CONNECTOR (B2P-VH) 2P									
< DIODE >						R417	1-259-456-11	CARBON	15K	5%	1/6W
D403	8-719-024-99	DIODE 11ES2-NTA2B				R418	1-259-444-11	CARBON	4.7K	5%	1/6W
D404	8-719-024-99	DIODE 11ES2-NTA2B				R419	1-259-388-11	CARBON	22	5%	1/6W
D405	8-719-024-99	DIODE 11ES2-NTA2B				R420	1-259-468-11	CARBON	47K	5%	1/6W
D406	8-719-024-99	DIODE 11ES2-NTA2B				△R421	1-212-974-00	FUSIBLE	47	5%	1/2W F
D407	8-719-987-63	DIODE 1N4148M									
D408	8-719-987-63	DIODE 1N4148M				R430	1-259-452-11	CARBON	10K	5%	1/6W
D409	8-719-024-99	DIODE 11ES2-NTA2B				R431	1-259-458-11	CARBON	18K	5%	1/6W
D410	8-719-024-99	DIODE 11ES2-NTA2B				△R451	1-249-393-11	CARBON	10	5%	1/4W F
D411	8-719-024-99	DIODE 11ES2-NTA2B				△R452	1-249-393-11	CARBON	10	5%	1/4W F
D412	8-719-302-38	DIODE RBV-602-01				△R453	1-249-405-11	CARBON	100	5%	1/4W F
< GROUND TERMINAL >						△R454	1-249-405-11	CARBON	100	5%	1/4W F
* EPT401	4-924-264-21	TERMINAL, MOUNT				△R455	1-247-745-11	CARBON	330	5%	1/2W F
< IC >						△R456	1-208-601-11	WIREWOUND	0.1	10%	2W F
IC401	8-759-111-68	IC uPC1237HA				△R457	1-208-601-11	WIREWOUND	0.1	10%	2W F
< TRANSISTOR >						R459	1-259-436-11	CARBON	2.2K	5%	1/6W
Q401	8-729-104-18	TRANSISTOR 2SC3514-Q									
Q402	8-729-104-91	TRANSISTOR 2SA1383				R460	1-259-432-11	CARBON	1.5K	5%	1/6W
Q403	8-729-232-45	FET 2SK1529-Y				R461	1-249-162-11	CARBON	10	5%	1/3W
Q404	8-729-232-46	FET 2SJ200-Y				R462	1-259-488-11	CARBON	330K	5%	1/6W
Q405	8-729-140-84	TRANSISTOR 2SC1841-PAFAEA				*****					
Q407	8-729-140-96	TRANSISTOR 2SD774-34				* 1-662-196-11	SP-SW BOARD				
Q430	8-729-119-76	TRANSISTOR 2SA1175-HFE				*****					
Q451	8-729-104-18	TRANSISTOR 2SC3514-Q				< CONNECTOR >					
Q452	8-729-104-91	TRANSISTOR 2SA1383				CN701	1-564-510-11	PLUG (MICRO CONNECTOR) 6P			
Q453	8-729-232-45	FET 2SK1529-Y				CN703	1-564-505-11	PLUG, CONNECTOR 2P			
Q454	8-729-232-46	FET 2SJ200-Y				CN704	1-691-765-21	PLUG (MICRO CONNECTOR) 3P			
Q455	8-729-140-84	TRANSISTOR 2SC1841-PAFAEA				< DIODE >					
Q406A	8-729-281-54	TRANSISTOR 2SC1815-BL				D701	8-719-987-63	DIODE 1N4148M			
< RESISTOR >						< TRANSISTOR >					
△R401	1-249-393-11	CARBON	10	5%	1/4W F	Q701	8-729-900-63	TRANSISTOR DTA124ES			
						Q702	8-729-142-36	TRANSISTOR BN1L3Z			
						< RESISTOR >					
						R701	1-260-093-11	CARBON	330	5%	1/2W
						R702	1-260-093-11	CARBON	330	5%	1/2W
						R703	1-260-103-11	CARBON	2.2K	5%	1/2W

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SP-SW

SP-TM

SW-F

VOL

Ref. No.	Part No.	Description	Remark		
R704	1-260-103-11	CARBON	2.2K	5%	1/2W
		< RELAY >			
RY701	1-515-622-11	RELAY			
		< SWITCH >			
S701	1-762-655-11	SWITCH, ROTARY SLIDE (SPEAKERS)			
*****					
*	1-665-580-11	SP-TM BOARD			
		*****			
		< CONNECTOR >			
CN804	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P			
* CN808	1-564-321-21	PIN, CONNECTOR 2P			
* CN809	1-565-792-11	PIN, CONNECTOR 2P			
		< DIODE >			
D501	8-719-987-63	DIODE 1N4148M			
		< FUSE >			
△F801	1-532-464-51	FUSE, TIME-LAG (T2.5A/250V)			
		< FUSE HOLDER >			
FH801	1-533-233-11	HOLDER, FUSE			
FH802	1-533-233-11	HOLDER, FUSE			
		< COIL >			
L501	1-411-906-11	COIL, AIR-CORE			
L551	1-411-906-11	COIL, AIR-CORE			
		< RESISTOR >			
R501	1-249-162-11	CARBON	10	5%	1/3W
R502	1-247-750-11	CARBON	680	5%	1/2W
R551	1-249-162-11	CARBON	10	5%	1/3W
R552	1-247-750-11	CARBON	680	5%	1/2W
R710	1-249-429-11	CARBON	10K	5%	1/4W
		< RELAY >			
RY501	1-515-920-11	RELAY (24V)			
		< TERMINAL >			
* TM501	1-537-519-11	TERMINAL BOARD (SPEAKER 8P) (BI WIRE SPEAKERS SYSTEM)			
*****					
*	1-662-193-11	SW-F BOARD			
		*****			
		< CAPACITOR >			
C601	1-136-165-00	FILM	0.1uF	5%	50V
C602	1-136-165-00	FILM	0.1uF	5%	50V
C603	1-126-926-11	ELECT	1000uF	20%	10V

Ref. No.	Part No.	Description	Remark			
< CONNECTOR >						
CN601	1-691-773-11	PLUG (MICRO CONNECTOR) 11P				
CNP601	1-774-936-11	CONNECTOR, BOARD TO BOARD 12P				
< TRANSISTOR >						
Q601	8-729-119-78	TRANSISTOR	2SC403SP-51			
Q602	8-729-900-74	TRANSISTOR	DTC143TS			
Q603	8-729-119-78	TRANSISTOR	2SC403SP-51			
Q604	8-729-900-74	TRANSISTOR	DTC143TS			
< RESISTOR >						
R601	1-260-089-11	CARBON	150	5%	1/2W	
R602	1-260-089-11	CARBON	150	5%	1/2W	
R603	1-260-095-11	CARBON	470	5%	1/2W	
R604	1-259-452-11	CARBON	10K	5%	1/6W	
R605	1-259-452-11	CARBON	10K	5%	1/6W	
< SWITCH >						
S601	1-762-656-11	SWITCH, ROTARY (TAPE MONITOR)				
S602	1-692-974-11	SWITCH, ROTARY (INPUT SELECTOR)				
*****						
*	1-662-192-11	VOL BOARD				
*****						
< CONNECTOR >						
CN201	1-691-770-11	PLUG (MICRO CONNECTOR) 8P				
< RESISTOR >						
R201	1-259-476-11	CARBON	100K	5%	1/6W	
R251	1-259-476-11	CARBON	100K	5%	1/6W	
< VARIABLE RESISTOR >						
RV201	1-225-228-11	RES, VAR, CARBON 120K/120K (VOLUME)				
*****						
MISCELLANEOUS						
*****						
△108	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (UK)				
110	1-506-113-00	SHORT PLUG				
△CNP801	1-777-185-11	CORD, POWER				
△S1	1-554-920-11	SWITCH, PUSH (AC POWER) (1 KEY)	(POWER)			
△T1	1-431-295-11	TRANSFORMER, POWER				
*****						
ACCESSORIES & PACKING MATERIALS						
*****						
3-860-500-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SWEDISH, ITALIAN, PORTUGUESE, GERMAN)					

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